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The effects of epistemic curiosity-based instruction in enhancing EFL students' reading and listening skills at a tertiary level

Yükseköğretimde İngilizceyi Yabancı Dil Olarak Öğrenen Öğrencilerin Okuma ve Dinleme Becerilerinin Geliştirilmesinde Epistemik Meraka Dayalı Öğretimin Etkileri

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Abstract

Epistemic curiosity is seeking novel information in numerous fields incessantly. An increasing number of studies have been carried out to evaluate the role of epistemic curiosity-based instruction in enhancing students' linguistic abilities at different stages of education. However, it was monitored that measuring the effects of epistemic curiosity-based instruction on reading and listening enhancement in Iraq context at a tertiary level was a gap in the literature which encouraged the researcher to initiate and finalize the study to fill this gap. In this regard, the present study was carried out to investigate the effects of epistemic curiosity-based instruction on students' reading and listening competence within a span of 14 weeks. 60 freshman Foundation English course students who joined lessons actively at TISHK International University in Erbil, Iraq were chosen by simple random sampling method in 2022-2023 Academic Year. Control group students followed an orthodox training cycle, while the students in experimental group followed an epistemic curiosity driven instruction. Collected data by integrating quantitative and qualitative instruments revealed that epistemic curiosity-based instruction enhanced students' reading and listening marks significantly. This study's implications can provide a basis for education stakeholders who are considering introducing an epistemic curiosity-based curriculum in educational institutions.

Keywords: Epistemic curiosity, reading, listening enhancement.

Özet

Epistemik merak, sürekli olarak birçok alanda yeni bilgiler aramaktadır. Eğitim kurumlarında epistemik merak dayalı öğretimin uygulanmasına artan bir ilgi vardır. Benzer şekilde, epistemik merak dayalı öğretimin, eğitimin farklı aşamalarında öğrencilerin dilsel yeteneklerini geliştirmedeki rolünü değerlendirmek için giderek artan sayıda araştırma yapılmıştır. Bununla birlikte, epistemik merak dayalı öğretimin Irak bağlamında okuma ve dinleme geliştirme üzerindeki etkilerinin üçüncül düzeyde ölçülmesinin, araştırmacıyı bu boşluğu doldurmak için çalışmayı başlatmaya ve sonlandırmaya teşvik eden literatürdeki bir boşluk olduğu izlenmiştir. Bu bağlamda, bu çalışma, epistemik merak dayalı öğretimin öğrencilerin okuma ve dinleme yeterlikleri üzerindeki etkilerini 14 haftalık bir süre içinde araştırmak amacıyla gerçekleştirilmiştir. 2022-2023 Akademik Yılında Irak'ın Erbil kentindeki TISHK Uluslararası Üniversitesinde derslere aktif olarak katılan 60 birinci sınıf Foundation English kursu öğrencisi basit rastgele örnekleme yöntemiyle seçildi. Kontrol grubu öğrencileri ortodoks bir eğitim döngüsünü takip ederken, deney grubundaki öğrenciler epistemik merak eksenli eğitim aldılar. Nicel ve nitel araçların entegre edilmesiyle toplanan veriler, epistemik merak dayalı öğretimin öğrencilerin okuma ve dinleme notlarını önemli ölçüde artırdığını göstermektedir. Bu çalışmanın sonuçları, eğitim kurumlarında epistemik merak dayalı bir müfredat sunmayı düşünen eğitim paydaşları için bir başlangıç olabilir.

Anahtar Kelimeler: Epistemik merak, okuma, dinlemeyi geliştirme.

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Introduction

Curiosity and fulfilling curiosity have been seen as essential for the continual betterment of people's lives. Thus, it has been asserted that the capacity to be inquisitive, investigate, and get more knowledge is innate in all humans, meaning that they are born with this trait (MacKinnon & Kuhn, 2022). In this regard, curiosity plays a crucial part in people's lives because it is expected to increase the degree of dignity once people expand their valued knowledge and share them in society, so people can take advantage of it and refine their knowledge. To name a few, pilots can earn more respect if they devise some life-saving tips out of curiosity to ensure passengers' safety in a troublesome situation and share their thoughts in a seminar with other pilots. Hence, farmers can be role models in their villages if they conduct ongoing research to produce fruits and vegetables in a pesticide-free way. Thus, they can support the potential customers and environment with their endeavors. Likewise, a civil engineer can do thorough research to employ new techniques while constructing which can pave way for building stronger structures. Hence, they can be more robust during the earthquakes. Similarly, an instructor can look for novel strategies incessantly to teach in a more engaging way, so learners' enthusiasm may increase accordingly. It can be stated that curiosity can have numerous good effects on the lives of individuals, regardless of their professions.

Certain classifications have been made about types of curiosity which are epistemic, diversive, specific and sensory with their distinguishing qualities. Epistemic curiosity (EC hereinafter) has been characterized as the desire to acquire new knowledge during one's lifespan, while diversive curiosity refers to channeling the energy to fulfill curiosity in many sources. On the other hand, specific curiosity is the pursuit of in-depth knowledge, whereas sensory curiosity has been identified as the pursuit of fresh experiences and stimuli. Tieben et al., (2011) emphasized five principles of evoking curiosity which were novelty, partial exposure, uncertainty, complexity and conflict. Novelty can be defined as being alert on novel experiences; partial exposure can be explained as having incomplete information; uncertainty means raising some doubts; complexity can be defined as being perplexed by ambiguity and conflict means having some contradictory experiences. It can be argued that the desire to reach valid and trustable information is the common goal while taking some initiatives out of curiosity.

Education based on the constructivist model has risen as the most popular method in the twenty-first century. Accordingly, constructivist learning theory has inspired educational institutions to implement EC-based instruction because constructivism puts

forward the idea that students actively develop their knowledge by creating links to earlier information and discovering novel information with numerous endeavors (Pande & Bharathi, 2020). In other words, early experiences are vital for enhancing learning so that students can gradually make connections with prior and present knowledge. Constructivism's fundamental concepts include actively constructing information, learning from others in a social context, creating connections to real-world experiences, stimulating the mind, and increasing motivation. Jerome Bruner, John Dewey, Jean Piaget, Maria Montessori, and Lev Vygotsky have made significant contributions to constructivism (Jia, 2010). Bruner's theory of development posits that learning occurs best when learners join hands on activities, see some images to recall hands on activities and verbalizing the overall process to share ideas (Yildiz, 2017; Ozdem-Yilmaz & Bilican, 2020). He asserts that they can internalize their learning and transfer the knowledge into long-term memory by applying the theory of development into educational contexts successfully. Dewey's pedagogy, for instance, believes that students improve their skills in an environment where they may interact with others and share ideas so that learners can increase their knowledge through inquiry-based education as opposed to passively listening to lectures (Williams, 2017; Kara, 2023). Similarly, Vygotsky's zone of proximal development (ZPD) suggests that systematic learning happens when learners are guided in a social setting with appropriate tasks (Silalahi, 2019). In other words, the level of difficulty should be proportional while teaching unfamiliar subjects. Furthermore, Piaget's theory suggests that hands-on activities, questioning, and investigation are essential factors to realize educational goals. Similarly, the theory of Maria Montessori emphasizes that learners are inherently inquisitive, allowing them to study and advance independently (Batubara et al., 2020). Her theory is predicated on the idea that self-paced and personalized training can facilitate learning once students' curiosity has been piqued by well-organized activities in a welcoming environment. These ideas reveal that constructivism and EC have many common points in terms of theoretical and practical perspectives.

Due to its significance and multiple advantages, the improvement of reading skills is gaining growing attention. Reading is a lifelong ability that is utilized in both the classroom and throughout life (Kuçukoglu, 2013; Abdulrahman & Kara, 2023). The individuals who have been reading regularly are expected to be more creative, open-minded, and respectable (Ulker et al., 2021; Yildiz, 2020). In the same vein, their chance to expand their word power, improve their comprehension and become more

successful at school or in their professional lives increases as they read in a systematic way. Likewise, predicting, making connections, visualizing, inferring, questioning, and summarizing are strategies to improve reading comprehension (Kuperman et al., 2022). Another essential point to be considered while integrating more reading activities into the curriculum is that there is chain reaction between reading regularly and improving other skills in English. For example, learners can increase their writing skills if they read some tips on writing academically. Likewise, they can be a good public speaker if they read some books on addressing some speech in communities. Similarly, they can sharpen their listening skills if they read some suggestions on note-taking skills. On the other hand, some barriers against reading are prevalent. It can be stated that reading is considered the building block for all essential skills in English.

Listening is vital to foreign language learning and fostering communication in different contexts. Hence, the development of L2 listening abilities strongly influences the development of other talents (Hagen et al., 2022; Wallace, 2022). For instance, good listeners can grasp key points in conversations and convert them into a writing and speaking format. In addition, good listeners are expected to be good readers because their lexical, semantic and syntactic knowledge are adequate enough to comprehend the texts (Wolf et al., 2019). It can be attested that improved listening skill can pave the way for the enhancement of other fundamental skills. Once learners can master listening skills, they have ample opportunity to prove their credentials in listening via internationally recognized standardized exams such as TOEFL, IELTS and PTE. Thus, they can be ahead of their rivals in a competitive job market upon graduation. It can be postulated that enhanced listening skills can offer several benefits in individuals' lives.

The research questions of the study were:

This study sought the effects of EC based instruction in improving learners' reading and listening skills. Moreover, their overall attitudes towards learning English out of curiosity were examined thoroughly. Based on this framework, the following research questions were formulated as follows:

- Does EC enhance learners' performance in terms of reading and listening?
- Does EC-based instruction affect learners' overall attitude towards learning English?

Literature Review

Curiosity is the driving force to make an attempt for novel information, so knowledge gaps can be reduced, and individuals can gain novel experiences

gradually. EC was initially defined and illustrated by Berlyne (1954) who asserted that sensory and cognitive curiosity urge people to access to new information. He also hinted those individuals can multiply their skills when they try all possible means to reach novel information and use them effectively in their educational, social and professional lives. Several contributions have been made on the concept of EC since the introduction of it by in the 1950s. To name a few, Loewenstein (1994) proposed the theory called information gap which underlines that the motivation to close the information gap increases as individuals research more about the topic. He asserts that prior information triggers the individuals to become more curious and expand their learning on the same topic. Intensity of curiosity increases the likelihood of closing the knowledge gap earlier than expected time. Subsequently, Rauterberg (1995) put forward incongruity theory which posits that knowledge gaps should not be neither too challenging nor too easy. He argues that manageable information gaps increase the motivation to learn and close the gaps accordingly. In other words, limitless knowledge gaps demotivate individuals to make further attempts. In addition, Litman (2010) coined the terms which were I- type and D-type curiosity. The former one refers to being exposed to novel information, while the latter is related to feeling deprived of existing knowledge and making efforts to fill the knowledge gap. Tieben et al. (2011) established a cycle which includes encountering, exploring, discovering, and adjusting to expand the knowledge in EC endeavors.

EC has received much attention recently by the stakeholders who have taken up certain positions professionally at various stages of education and global initiatives which have been set up to raise standards in education. To name a few, Jirout and Klahr (2012) assert that EC based instruction fosters students' learning in primary schools dramatically. Similarly, Pellegrino (2017) postulates that primary education should not only teach how to acquire knowledge but also guide students on how to be eager to learn in an engaging way which can be possible with an EC based instruction. They also postulate that students can get the inspiration to learn further while they seek information from different sources as videos, presentations, articles, stories etc. Additionally, Fouad et al. (2015) state that curiosity encourages high school students to combine theoretical knowledge with practical one, so they can have a chance to apply their learning into their social lives in an interaction with various activities inserted into curriculum in a successful way. Passion for learning and teaching has an undeniable impact on student achievement; therefore, passionate teachers are continually striving to improve student performance (Celik & Yildiz, 2017). Likewise, Eren (2009) attests that EC based instruction can

develop students' critical thinking, problem solving skills which can enhance students' achievement marks substantially at a tertiary level, so expressing ideas independently, learning in an interactive environment and researching thoroughly can be defined as the distinguishing factors of EC based instruction. According to OECD (2018) acquiring knowledge, checking the accuracy of the information by researching from multiple sources, having effective learning experiences are key considerations to progress and succeed at all levels of educational institutions. Additionally, this OECD report also underlines that fostering children's social, emotional and cognitive skills out of curiosity support them to be curious as long as they are alive. Considering the aforementioned perspectives, it can be stated that EC can appeal to students at all levels regardless of their ages.

During the last two decades, a growing interest has been noticed on the effects of EC based instruction in improving English proficiency of learners (Yildiz, 2021; 2022). Some scholars (Metcalf et al. 2020; Tang & Aro, 2021; Wale & Bogale, 2021) argue that EC yields better results to raise the standards in education, whereas a limited number of scholars (Wilson, 2021; Johnson & Tawfik, 2022) assert that EC sets some barriers against learning efficiently. Although most of the studies conducted on EC offer promising gains, whereas few ones raised some doubts about the efficiency of it. To name a few, Lowry and Johnson (1981) examined the effects of EC on reading ability which revealed that primary school students' reading ability was enhanced and their overall attitude towards learning English changed positively in the US context. Similarly, Tobin and Guadagno (2022) carried out a study with 306 adults from a range of countries through a questionnaire which unearthed that podcast EC developed students' listening skills via podcasts considerably. In addition, Nakamura et al. (2022) conducted a study on 25 Thai students in an English oral communication course enriched by EC which revealed that curiosity-based instruction inspired the students to increase their self-confidence ensuring their creativity. Furthermore, Hong et al. (2022) stated that EC based instruction enhanced students' writing skills substantially in an Academic Writing course in China context. They asserted that encouraging students to do prior research before writing increased their willingness and motivation dramatically. Likewise, Wale and Bishaw (2020) found that EC based instruction stimulated students' critical thinking skills substantially. However, some studies culminated in some doubts about implementation of EC based instruction. For example, Tan & Tan, (2020) conducted a study in Malaysia which revealed that curiosity-based activities via games did not yield better results for all students in terms of acquiring new words and composing sentences related to new words. Similarly, Jiang (2021) proposed that

implementation of curiosity-based instruction cannot ensure progress academically unless prior orientation period has been completed.

Methodology

Research Design

A mixed methods design was adopted in this study which required using qualitative and quantitative instruments harmoniously based on the pre-defined research plan. O'Cathain et al. (2010) assert that a mixed methods design offers several advantages to researchers such as receiving numerical and verbal data and cross-checking them whether there are some conflicts between different instruments. Additionally, they postulate that weaknesses of several instruments can be reduced to a large extent once the researchers are free to choose any qualitative and quantitative instrument according to the necessities.

Participants, Setting and Sampling Procedure

A renowned private university which is TISHK International University (TIU henceforth) in Erbil, Iraq was chosen as the setting. The underlying reasons to choose this university are that the medium of instruction has been completely English; nationals of various countries have received education peacefully and students have been eager to join such studies. The population of the study was all students who took Foundation English course during the year. Foundation English course students took this course to master English and be able to express their ideas in a written and spoken format required by their departments to earn a degree with a high GPA. This course was run by experienced and dynamic academics of TIU Language Preparatory School. The lessons were enriched with the latest technology and modern methodologies. To name a few, they read some e-books, addressed some presentations, wrote an essay and received precious feedback weekly, played educational online games, watch some movies and documentaries on Netflix or Youtube and took online revision tests, available on Lecture Notes website. Additionally, they took their exams in a Zip Grade enriched format, so each student's mistakes, frequently missed questions and means of each class were archived and analyzed in each common meeting for the betterment of the education. Their progress and mistakes were noted and students were informed about their common mistakes periodically.

The participants to represent the population were chosen by employing simple random sampling method. Simple random sampling offers some flexibility for researchers to choose the sample in an unbiased way fairly (Rahman et al., 2022). The researcher saved all Foundation English students

and chose the sample via a software application called online random picker. The researcher chose 30 students for each group as control and experimental out of 150 students who took Foundation English course in 2022-2023 Academic Year. They joined some workshops to be familiar with both instruction modes which were traditional

and EC based one. Additionally, students' consent forms were collected. Once they were familiar with each method of instruction, the study was initiated. Participants' demographic and departmental distribution can be seen below in Table 1 and 2 respectively.

Table 1.
Participants` frequency in terms of gender and age

Variable(s)	Option	F	%
Gender	Female	34	56.7
	Male	26	43.3
Age	17-18	19	31.7
	19-20	21	35
	21-22	14	23.3
	23-24	6	10
Total		60	100

As shown in Table 1, 34 (56.7 %) female students participated in the study, whereas 26 (43.3 %) male students joined the study. Additionally, 19 (31.7 %) were between 17 and 18 years old; 21 (35 %) students were between 19 and 20 years

old; 14 (23.3 %) students were 21 and 22 years old and 6 (10 %) students were between 23 and 24 years old. It was observed that female students were higher than male ones, and students aged 19 and 20 were dominant in this study

Table 2.
Distribution of participants` departments

Departments	Frequency	%
Accountant	3	5
Architectural Engineering	4	6.67
Aviation Engineering	2	3.33
Banking and Finance	2	3.33
Business and Management	3	5
Computer Engineering	6	10
Dentistry	7	11.67
IT	4	6.67
Interior Design	4	6.67
Mechatronics Engineering	2	3.33
Medical Analysis	6	10
Nursing	5	8.33
Petro-chemical Engineering	3	5
Pharmacy	8	13.33
Physiotherapy	1	1.67
Total	60	100

Table 2 illustrates that students were chosen from 15 different departments, with the highest number of participants from pharmacy and the lowest from physiotherapy.

Instruments

Quantitative data were collected through pre-test and post-test exams including reading and listening questions equally. However, qualitative data were collected through the questionnaire, the interview and the survey. Exam results were inserted into SPSS 23. to analyze via independent

samples t test. Subsequently, numerical data in the survey and questionnaire were fetched and analyzed by SPSS 23. as well. However, the transcripts of the interview were categorized in common themes through MAXQDA software program. Gaili (2022) asserts that SPSS has been used extensively in Social Sciences to analyze data in line with scientific methods, so it allows the researchers to make more precise interpretations rather than relying on personal remarks. In addition, Guetterman and James (2023) state that MAXQDA application helps the researchers to classify data according to common points and focus on each interviewee within seconds, so its popularity has risen tremendously in the last 10 years.

Data Collection Procedure

The study lasted 14 weeks to initialize and finalize the data. All participants received both types of instruction regardless of being in control or experimental group within two weeks. In other words, all students joined the lessons traditionally in the initial period. The underlying reason to introduce both types of instructions was that they could compare one instruction with another after joining the study in one group. Once common lessons were completed, the participants were placed in two groups to receive different treatments.

14 weeks were required to collect and analyze the data in the present study. In the first week, all participants, regardless of whether they were in the control or experimental group, received both forms of instruction. In other words, all pupils were introduced with the basics of traditional teaching method and EC based teaching method. The fundamental rationale for introducing two sorts of instructions was that participants could compare one instruction to the other once the study was completed. After being familiar with two types of teaching methods, participants were divided into two groups to receive different treatments according to pre-defined schedule.

The Cycle of Instruction in Control Group

The participants in control group completed 6 units in Scope 1 published by Oxford. They read the passages about London as a cosmopolitan city, Different Lives to be knowledgeable about types of families, Go, Go, Go to be familiar with various expeditions as an adventurous person, A Fast Way to Bad Health to have further information on disadvantages of fast food and Masters of Memory to introduce people with photographic memories. Apart from reading

passages, they were exposed to some videos and audio tracks to develop their listening skills. The videos were related to The United Kingdom, Teens and Pocket Money, The Australian Climate, British Food and Roman Britain. The audio tracks were about children who received online education in the Australian outback, Adam's money collection habit from different countries, Kevin's phone calls with his father while he is travelling to various countries, the food program to introduce school lunches in Britain, the USA and Japan. Finally, they listened to a conversation on Anna's history homework which was about introducing a family member for a history homework.

The instructor covered these topics according to the syllabus. S/he covered a unit biweekly. S/he assigned some pages in workbook to increase their learning rate. On the other hand, students were not urged to expand their learning by doing extra research on related topics. They were satisfied with the activities of the book during lectures.

The Cycle of Instruction in Experimental Group

The participants in experimental group completed 6 units in Scope 1 published by Oxford. They read the passages about London as a cosmopolitan city, Different Lives to be knowledgeable about types of families, Go, Go, Go to be familiar with various expeditions as an adventurous person, A Fast Way to Bad Health to have further information on disadvantages of fast food and Masters of Memory to introduce people with photographic memories. Apart from reading passages, they were exposed to some videos and audio tracks to develop their listening skills. The videos were related to The United Kingdom, Teens and Pocket Money, The Australian Climate, British Food and Roman Britain. The audio tracks were about children who received online education in the Australian outback, Adam's money collection habit from different countries, Kevin's phone calls with his father while he is travelling to various countries, the food program to introduce school lunches in Britain, the USA and Japan. Finally, they listened to a conversation on Anna's history homework which was about introducing a family member for a history homework.

The instructor covered these topics according to the syllabus as well as urging the students to research thoroughly about given topics. S/he covered a unit biweekly. S/he assigned some pages in workbook to increase their learning rate

as well as assigning some homework to research and write creatively. In other words, arousing students' curiosity was prioritized in experimental group. For example, they visited British Council or Woodward English Grammar website to be more knowledgeable about tenses and shared their tips in class to activate peer-learning. In addition, they watched further documentaries about the UK to share their thoughts while studying relevant unit. Subsequently, they read some articles in blogs to be familiar with different expeditions while

studying the unit on travel experiences. All in all, further reading and listening activities were at the core of the instruction in the experimental group. The instructor facilitated their learning as a guide rather than forcing them to learn in the lectures monotonously. Interaction, peer-learning, brainstorming were common considerations in experimental group.

A sample homework schedule in experimental group is depicted in Table 3.

Table 3.
Depiction of homework schedule in experimental group

Sunday	Do thorough research on the internet about different nationals living in London
Tuesday	Visit TIU LPS Foundation English Lecture Notes website and take the quiz on unit 1
Wednesday	Read a story on a challenging expedition and summarize it in the class in a spoken format
Thursday	Watch a video on fast food and express your ideas on fast food in a written format
Friday	A Thorough Revision
Saturday	A Thorough Revision

The experimental group's homework policy was based on the concepts of EC-based instruction. The main goal was to provide opportunities for each student to improve their English in a written and spoken format. Students were encouraged to learn by inquiry; therefore, tasks were designed to require them to search different websites. To illustrate, after conducting research on assigned themes, students presented their findings in class. Hence, they had the opportunity to confidently share their thoughts and were encouraged for the following tasks. The instructor allotted a specific amount of time for each student's presentation so as to treat them fairly. In the subsequent phase,

the instructor organized some debates to engage in collaborative learning activities. After completing these tasks, participants were given a brief quiz consisting of five multiple-choice questions on the topic presented that day. The purpose of the test was to measure pupils' retention rates. In addition, this quiz provided students with opportunities to identify their errors and focus on eliminating them day by day. This cycle was repeated weekly with new responsibilities according to a predetermined schedule. A sample homework schedule in experimental group is depicted in Table 4.

Table 4.
Depiction of homework schedule in control group

Sunday	Complete the exercises on pages 38 and 39 in workbook
Monday	Complete the exercises on pages 40 and 41 in workbook
Tuesday	Write 5 sentences about feeling adjectives
Wednesday	Write 5 sentences about last week
Thursday	Complete the exercises on pages 42 and 43 in workbook
Friday	A Thorough Revision
Saturday	A Thorough Revision

The policy for assigning homework in the control group was based on the principles of traditional teaching approaches. The purpose of the activities was to improve their accuracy rather than their fluency. In addition, the activities in

the book were followed strictly without resorting to other online resources. As indicated by the aforementioned homework structure, the students closely followed the instructor's

assignments and remained passive in several occasions.

Results and discussion

Findings of this study were classified under 4 headings which were the questionnaire, the survey, the interview and precise analysis of

exam results, so each instrument was elaborated to get detailed analysis and make interpretations accordingly.

The Analysis of the Questionnaire

Students' opinions towards EC based instruction was visualized in Table 5.

Table 5.
Participants' responses in experimental group

ITEMS	Mean	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
		%	f	%	f	%	f	%	f	%	f
1. I was so motivated while learning via traditional teaching methods.	2.06	10%	3	10%	3	10%	3	17%	5	53%	16
2. My critical thinking skills developed considerably in this study.	2.43	7%	2	10%	3	40%	12	7%	2	37%	11
3. I realized that my reading skills were enhanced in this study.	2.7	7%	2	10%	3	57%	17	0%	0	27%	8
4. I am more self-confident after joining this study.	2.2	7%	2	13%	4	20%	6	13%	4	47%	14
5. I expanded my knowledge when my teacher taught me in a traditional classroom atmosphere.	2.8	7%	2	27%	8	37%	11	0%	0	30%	9
6. My instructor ran this study to increase our learning collaboratively.	2.43	7%	2	10%	3	20%	6	47%	14	17%	5
7. I wish I had joined such a study earlier.	2.03	7%	2	13%	4	13%	4	10%	3	57%	17

The findings of item 1, which was about the degree of motivation after being exposed to traditional teaching methods, indicated that the mean score was insignificant. To illustrate the data, 3 (10 %) students chose strongly agree; 3 (10 %) students chose agree and 3 (10 %) students chose neutral and 5 (17 %) students chose disagree. On the other hand, 16 (53 %) students chose strongly disagree. These figures show that most students noticed a negative correlation between the level of motivation and employing a traditional teaching method.

The findings of item 2, which was about developing critical thinking skills via traditional teaching methods, indicated that the mean score was insignificant. To illustrate the data, 2 (7 %) students chose strongly agree; 3 (10 %) students chose agree and 12 (40 %) students chose neutral

and 2 (7 %) students chose disagree. On the other hand, 11 (37 %) students chose strongly disagree.

These figures show that most students noticed a negative correlation between developing critical thinking skills and receiving a traditional instruction.

The findings of item 3, which was about enhancing reading skills via traditional teaching methods, indicated that the mean score was insignificant. To illustrate the data, 2 (7 %) students chose strongly agree; 3 (10 %) students chose agree. On the other hand, 17 (57 %) students chose neutral and 0 (0 %) students chose disagree and 8 (27 %) students chose strongly disagree. These figures show that most students noticed a negative correlation between developing reading skills and receiving a traditional instruction.

The findings of item 4, which was about the degree of self-confidence via traditional teaching methods, indicated that the mean score was insignificant. To illustrate the data, 2 (7 %) students chose strongly agree; 4 (13 %) students chose agree. On the other hand, 6 (20 %) students chose neutral and 4 (13 %) students chose disagree and 14 (47 %) students chose strongly disagree. These figures show that most students noticed a negative correlation between raising self-confidence and receiving a traditional instruction.

The findings of item 5, which was about Expanding overall English knowledge via traditional teaching methods, indicated that the mean score was insignificant. To illustrate the data, 2 (7 %) students chose strongly agree; 8 (27 %) students chose agree. On the other hand, 11 (37 %) students chose neutral and 0 (0 %) students chose disagree and 9 (30 %) students chose strongly disagree. These figures show that most students noticed a negative correlation between expanding overall English knowledge and receiving a traditional instruction.

The findings of item 6, which was about Rating the performance of the instructor who employed a traditional instruction method, indicated that the mean score was insignificant. To illustrate the data, 2 (7 %) students chose strongly agree;

3 (10 %) students chose agree. On the other hand, 6 (20 %) students chose neutral and 14 (47 %) students chose disagree and 5 (17 %) students chose strongly disagree. These figures show that most students did not enjoy the conduct of lessons in a traditional atmosphere run by the instructor.

The findings of item 7, which was about feeling regretful for not having joined this study earlier, indicated that the mean score was insignificant. To illustrate the data, 2 (7 %) students chose strongly agree; 4 (13 %) students chose agree. On the other hand, 4 (13 %) students chose neutral and 3 (10 %) students chose disagree and 17 (57 %) students chose strongly disagree. These figures show that most students did not feel regretful for not having joined such a study earlier.

Considering all the aforementioned data collected from control group students whose teaching method was traditional run by the instructor, it can be argued that the overall satisfaction rate was far less than experimental group students whose instruction was enriched by EC.

Students' opinions towards traditional teaching methods was visualized in Table 6.

Table 6.
Participants' responses in experimental group

ITEMS	Mean	Strongly Agree		Agree		Neutral		Disagree		Strongly Disagree	
		%	f	%	f	%	f	%	f	%	f
1. While I was learning out of curiosity, my motivation was boosted.	4.63	70 %	21	23%	7	7%	2	0%	0	0%	0
2. I think my critical thinking skills were stimulated in this study.	4.6	60%	18	40%	1 2	0%	0	0%	0	0%	0
3. This study was so helpful to develop my reading skills.	4.86	87 %	26	13 %	4	0%	0	0 %	0	0%	0
4. I can express my ideas in a more self-confident way after this study.	4.20	27 %	8	63%	1 9	1%	3	0%	0	0%	0
5. Doing research at home and sharing my thoughts in class were so beneficial.	4.73	73 %	22	27%	8	0%	0	0%	0	0%	0
6. Being guided by my instructor helped me to fill knowledge gaps.	4.93	93 %	28	7%	2	0%	0	0%	0	0%	0
7. I wish I could have joined such a revolutionary study earlier.	4.76	87 %	26	3 %	1	10 %	3	0 %	0	0 %	0

The findings of item 1, which was about the correlation between motivation level and learning out of curiosity, indicated that the mean score was quite significant. To illustrate the data, 21 (70 %) students chose strongly agree; 7 (23 %) students chose agree and 2 (7 %) students chose neutral. On the other hand, no response was recorded neither in disagree nor strongly disagree. These figures show that most students appreciated the period on grounds that they boosted their motivation.

The findings of item 2, which was about the correlation between critical thinking skills and learning out of curiosity, indicated that the mean score was quite significant. To illustrate the data, 18 (60 %) students chose strongly agree; 12 (40 %) students chose agree. On the other hand, no student chose other options. These figures show that most students appreciated the period on grounds that they developed their critical thinking skills.

The findings of item 3, which was about the correlation between reading skills and learning out of curiosity, indicated that the mean score was quite significant. To illustrate the data, 26 (87 %) students chose strongly agree; 4 (13 %) students chose agree. On the other hand, no student chose other options. These figures show that most students appreciated the period on grounds that they developed their reading skills substantially.

The findings of item 4, which was about the correlation between self-confidence and learning out of curiosity, indicated that the mean score was quite significant. To illustrate the data, 8 (27 %) students chose strongly agree; 19 (63 %) students chose agree and 3 (10 %) students chose neutral. On the other hand, no student chose other options. These figures show that most students appreciated the period on grounds that they boosted their self-confidence tremendously.

The findings of item 5, which was about the correlation between doing research and expressing the information in the class gained by the research, indicated that the mean score was

quite significant. To illustrate the data, 22 (73 %) students chose strongly agree; 8 (27 %) students chose agree. On the other hand, no student chose other options. These figures show that most students appreciated the period on grounds that they expanded their knowledge at home and uncovered their ideas in class.

The findings of item 6, which was about the correlation between the instructor's efforts and filling the knowledge gaps, indicated that the mean score was quite significant. To illustrate the data, 28 (93 %) students chose strongly agree; 2 (7 %) students chose agree. On the other hand, no student chose other options. These figures show that most students appreciated the period on grounds that they appreciated the instructor's efforts to learn further information.

The findings of item 7, which was about feeling regretful for not having joined this study earlier, indicated that the mean score was quite significant. To illustrate the data, 26 (93 %) students chose strongly agree; 1 (7 %) students chose agree and 3 (10 %) students chose neutral. On the other hand, no student chose other options. These figures show that most students would rather have joined this study earlier.

Considering the gathered data in 7 items, it can be argued that students, who learned via EC based instruction, were quite satisfied with the overall process in experimental group.

Descriptive Data Analysis

Descriptive data were gathered and analyzed via independent samples and paired samples t test. The former was run to make a comparison between control and experimental group considering pre-test and post-test results, whereas the latter was run to test whether the means of two paired measurements within control or experimental group are statistically different.

Independent samples t test analysis was given in Table 7.

Table 7.
Independent samples t test analysis

Variables	Groups	N	Mean	SD	t	df	Sig
Pre-test	Control	30	53.17	11.483			
Pre-test	Experimental	30	53.33	12.753	-.053	58	.958
Post-test	Control	30	56.33	18.427			
Post-test	Experimental	30	69.50	15.049	-3.031	58	.004

Note. $P < 0.05$

Independent samples t-test was run to measure whether there was a statistical difference between each group considering pre-treatment and post-treatment results. According to the gathered data, control group students started the study with a 53.17 mean score, while it was 53.33 in experimental group. Correspondingly, the p-value is .958 which was higher than 0.05, so there was no statistical difference between each group in the initial period. However, post-test results revealed that control group students increased their marks to 56.33, whereas the mean score was 69.50 in experimental group. In other words, control group students' progress was insignificant, while it was quite noticeable in

experimental group. Accordingly, post test results revealed that p-value was .004 which was less than 0.05. These figures revealed that experimental group students who followed an EC based instruction increased their reading and listening marks substantially, while the progress in control group students who followed a traditional instruction made a minor leap from their previous position. Considering the detailed analysis thorough independent samples t test, it can be argued that EC based instruction yielded more promising outcomes, while traditional teaching method did not produce satisfactory results.

Table 8.
Participants' common words to describe traditional learning

Categories	Frequency	%
1 Teacher as the sole authority	28	96.67
2 Learning Individually	29	86.67
3 Undertaking Less Responsibility	26	100
4 Being passive	30	93.33
5 Getting Bored	28	76.67
6 Theoretical	23	96.67

As is evident in Table 9, participants highlighted reflections on traditional teaching approaches. They view the teachings as teacher-centered, focused on individual endeavors, undertaking a

limited responsibility, being passive, having boring classes, and being exposed different amounts of theoretical knowledge.

Table 9.
Participants' common words to describe EC based instruction

Categories	Frequency	%
1 Teacher as a guide	29	96.67
2 Learning in cooperation	26	86.67
3 Feeling More Responsible	28	93.33
4 Being Active	27	90
5 Engaging	25	83.33
6 Practical	27	90

In contrast, Table 9 demonstrated that inquiry-based learning adopted in the experimental group, resulting in higher student satisfaction. They underlined that student-centered instruction, cooperative learning, increased responsibility, physical activity, engaging classes, and practical knowledge acquisition were essential considerations in EC based classes.

which were highlighted in each group were highlighted below:

Selected Interviews in Experimental Group

Being an Active Speaker

I got so much pleasure while doing activities in this study. My instructor guided us to broaden our horizon day by day. For example, we did a thorough research about challenging expeditions before reading a passage on them. Additionally, we watched some videos about different types of collections before listening to the audio track on money collection. Additionally, we expanded our knowledge about different cultures, ethnicities

The Analysis of the Interview

The participants' genuine opinions were transcribed and categorized with the help of MAXQDA software program. Common themes

and landmarks while researching on London. Whenever we were assigned doing thorough research, our instructor encouraged us to share our ideas in the lecture, so we learned from each other collaboratively. As a concluding remark, I can tell that I wish I could have received such a revolutionary instruction before. My mood changed positively, and my linguistic abilities developed substantially as long as I took part in activities in this study. (St 14)

Fulfilling Thirst for Knowledge

I used to receive a traditional instruction in high school where I could not learn by inquiry. There were many question marks about the topics I learned. However, I did not do thorough research about them because there was no opportunity to share and discuss them in classes. Once I heard about this study, I felt so excited. I thought that I would research and exchange my ideas with my instructor and classmates. This study changed my perspectives positively. I filled the knowledge gaps in my mind, so I asserted my ideas in a more self-confident way. Additionally, I learned a lot from my friends. When we exchanged our ideas, we learned how to develop critical thinking skills in a peaceful atmosphere. In addition, the topics in the book were more engaging for us because we knew that we would fulfill our thirst for knowledge sooner or later. Breaking the monotony changed my attitudes towards learning English positively. I am glad to have participated in all activities in this study. (St 18)

Improving Listening Skill via Different Materials

I used to have serious problems about listening before this study which helped me to regain my self-confidence. My instructor directed me to watch some relevant videos before the lesson, so I increased my background knowledge about the audio track which we would listen to in the following day. In addition, I listened to some conversations and read the transcripts of them to improve my listening skills. This training period helped me to develop my listening skill day by day. Now I can comprehend the listening tracks in the book without having any difficulty. It was a very fruitful period for me under the supervision of my instructor. (St 20)

Developing Reading Skills via Supplementary Materials

Reading passages were quite difficult for me to understand previously. However, my instructor sent me some related e- reading passages which

were graded according to my level. I read them periodically and took online tests about the given passages, so I could see my progress easily. In addition, I could use the online dictionary to learn the key words in the passages. Thus, my learning rate increased substantially. Subsequently, reading supplementary materials on the internet helped me to complete the activities on time by employing skimming and scanning techniques. This habit saved me during the exams. I could not see a lot of questions in previous exams due to bad time management skills, but now I know how to scan and skim through to save time and complete all reading questions on time. (St 26)

Earning More Respect in Society

During the study, we did research extensively on various topics related to daily lives, so we could use them in our daily conversations. For example, my cousin visited us, and I mentioned some adventurous expeditions which I learned during the study. Moreover, I depicted the disadvantages of eating fast food with clear examples because we read, watched many documents related to it. S/he listened to me very eagerly because the topics and details captured his/her attention. My motivation to research more and more increased tremendously after this occasion. Now I try to learn new things each day thorough the internet because I know that I will use them in my conversations. (St 29)

Positive Effects of EC to Develop Speaking Skills

I had no idea about EC previously. However, I had some information about learning by discovery. This study helped me to express my ideas confidently because we did thorough research about the topics to be covered in the following day. When we researched in advance, we took notes and revised our sentences earlier. Thus, this preparation period was a fruitful period for us. In addition, we expanded our vocabulary knowledge substantially while examining various sources. In the past, our instructor asked us questions to tell our ideas immediately during which we suffered a lot. However, our instructor guided us professionally in this study. We took the initiative to speak more once our levels were satisfactory enough. Making prior research and increasing the duration of speaking gradually increased the quality of education and boosted our performance tremendously. (Student 16)

Selected Interviews in Control Group

Unable to Eager to Learn Enthusiastically

We received the instruction in a traditional format, so we followed the book's activities without switching to any extra materials. Although we progressed well at first, our motivation reduced day by day due to repeating the same procedure. When we knew what to do and how to progress in advance, it did not capture my attention. I learn better when I feel surprised with supplementary activities such as inspiring videos, informative articles or some news. These activities help me feel engaged. However, these details were missing in the study which reduced my enthusiasm dramatically. I wish my instructor integrated some web-enhanced activities into the curriculum and pushed us to do research before each lesson. (St 7)

Having Difficulty Learning New Words in Reading Passages

Our instructor taught us the new words in the passages traditionally. S/he only explained the verbally without encouraging us to make some efforts about the meanings of them the day before the lesson. However, my best friend was in the other group. The instructor told them to do research about the meaning of key words and composing a sentence for each key word before the lesson. when the lesson started, they were ready to tell the meaning and compose a sentence accordingly. In addition, they had some video talks with their friends to summarize the reading passages before the exams. These endeavors kept them motivated, but these considerations were not available in my group. I wish my instructor had urged us to do research and contribute to lessons actively rather than keeping us passive. (St 13)

Unable to Catch Essential Points in Listening Exercises

We listened to the audio tracks in the lesson and progressed to other activities. However, I forgot the details as we continued with other activities. Additionally, my instructor showed us some tips about note taking. However, I could not learn them well due to lack of concentration. On the other hand, my friends in the other group had ample opportunity to listen to it again and summarize it in the following day. Additionally, they were encouraged to watch different videos on improving their note taking skills. They told me that they learned an effective tip from each speaker in videos, so they had a chance to apply

these tips into their listening activities. Each student's learning style is different, so allowing the students to learn from various materials can inspire them to develop their listening skills with proven techniques. (St 20)

Having Less Freedom to Direct Learning Cycle

Our lessons did not allow us to express our ideas freely from multiple sources because the activities of the book required us to answer shortly. However, I wanted to share my ideas about different topics as a debate after researching on the internet. I know that answering shortly was not beneficial in the long run. I needed to express my ideas in a few minutes, so I could uncover my ideas. Additionally, allowing students to tell their ideas based on their research could help them to learn from each other. As a result, I believe that guiding students to learn from different sources and valuing their ideas in the class can pay off. I wish we could have had such an instruction. (St 24)

Unable to Make Connections between Theoretical and Practical Knowledge

My learning period was not satisfactory for me. I learned the topics in the lesson, but I could not see real-life examples of them in my social life. For example, I learned basics of superlative sentences, however, I could not get any information about the tallest buildings, the richest man, the most populated country, the largest continent or the smallest animal. On the other hand, my friends in the other group visited some websites about superlatives as a part of their assignment and shared their ideas about superlatives. As a result, their knowledge on superlative sentences expanded considerably. I would be more glad now if I had received such an inspiring instruction. My willingness reduced when I could not see real life reflections of the topics in the book. I like exploring and sharing my ideas in the class, so we can get more pleasure while learning in an interactive atmosphere. (St 27)

This study examined the impact of EC-based instruction on the reading and listening abilities of students by employing a mixed methods design instruments. On the basis of the findings in each instrument, the following significant points were emphasized.

The findings of pre- and post-tests demonstrated that EC-based education laid the foundation for a

substantial increase in reading and listening grades. This outcome was consistent with the findings of Jiang et al, (2018) who asserted that EC-based training enables students to improve their reading and listening abilities gradually. In addition, the findings of the survey and questionnaire indicated that student-centered learning, collaboration, interaction increased students' motivation to a large extent which was in line with Grigorescu's (2020) study which revealed that motivation of the participants increases once students have more authority in the learning process. Likewise, Abubakr and Kara (2022) postulate that students' engagement level increases when students do research and share their thoughts in a classroom atmosphere because they notice that their ideas are valued in the lesson. Similarly, Eren (2009) stated that the students are likely to be more motivated if the classes are created to accommodate their needs on curiosity. Apart from increased marks and motivation, the study unearthed some reflections on self-confidence. Most students stated that the more they spoke, the more self-confidence they had which was in line with Gurler's (2015) study which indicated that there is a positive correlation between fostering a communicative atmosphere in class and students' self-confidence in EFL classes. Moreover, most students asserted that they developed their critical thinking skills considerably which was consistent with Prayogi and Asy'ari's (2021) study which unearthed that students can improve their critical thinking skills substantially once they expand their knowledge by researching out of curiosity. Furthermore, the students reaffirmed that interaction during the sessions assisted them to learn from each other, so they activated peer-learning subconsciously which was consistent with the study of Barron and Darling Hammond (2008). In addition, students valued the transition from theoretical to practical knowledge that EC-based training made possible. This outcome was consistent with Adhami and Taghizadeh's (2022) study which suggested that embedding theoretical knowledge into practice can be accomplished through EC-based training because students can observe several practical solutions and reflections while going through the activities day by day. In light of the gathered data, it can be stated that EC based instruction yielded promising results in terms of enhanced listening, reading performance, developed critical thinking skills, improved self-confidence and positive attitudes towards learning English collaboratively.

Conclusion

The present study unearthed that EC-based instruction played crucial roles in transforming the quality of education and enhancing learners' reading and listening skills significantly. In other words, training based on EC considerably improved students' scores in reading and listening. Moreover, students' motivation, engagement, and self-confidence were improved correspondingly. In the same vein, students' attitudes towards learning English changed positively. Subsequently, they were confident in their ability to overcome obstacles after taking the initiative to expand their learning from different sources. The revealed data suggested that EC-based instruction holds great promise for students, teachers, administrators and policymakers.

Several recommendations for future research can be verbalized. This study examined the impact of EC-based training on reading and listening abilities. Future studies can be conducted to extend the scope of the study with additional skills. In addition, only marks of students in the control and experimental groups were compared. It is possible to do additional research to determine whether or not gender influences the outcomes. In addition, this study collected data from only freshman students in one unit of a university, which can be extended with other stages to enrich the sample. Finally, this study lasted 14 weeks which can be extended to measure the effects of EC in longer periods.

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